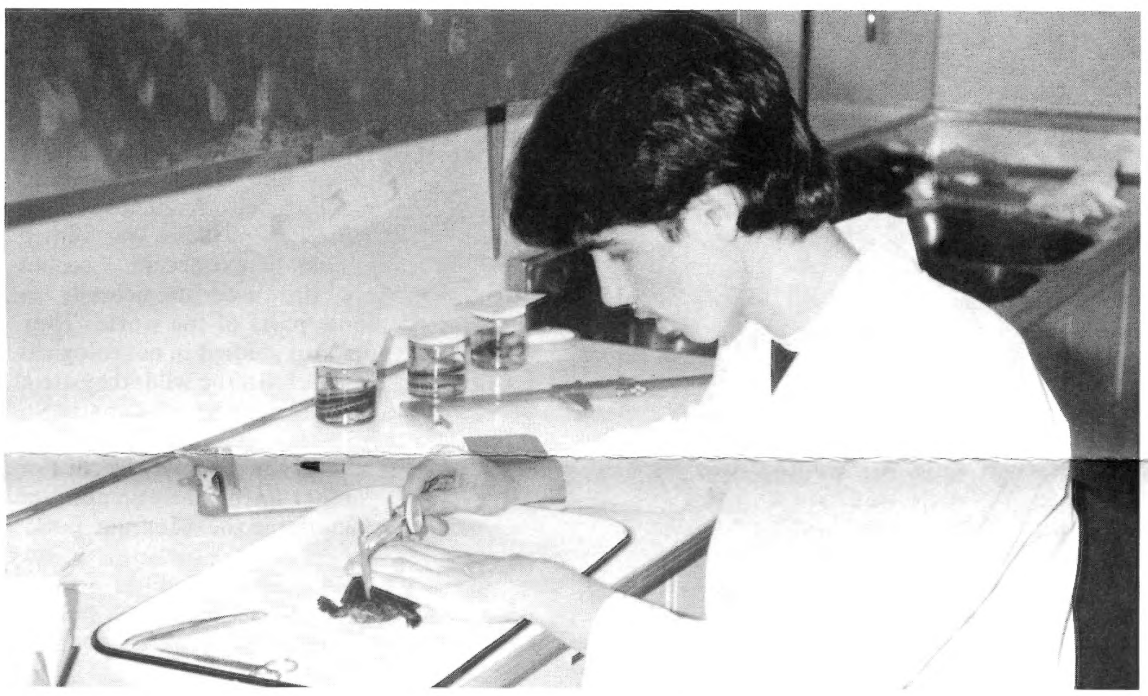
BIOME

A publication of the National Museum of Natural Sciences

Vol. 5:2 1985 ISSN 0712-9319

Giving a Dinosaur a Helping Hand



Raymond Saumure, who is 17 years old, has been with the Museum for almost three years.

Can you imagine holding a dinosaur bone in your hands for the very first time? You can? Good! Now picture yourself in front of twenty-five dinosaur authorities, each about to ask a thought-provoking question. And remember, ten of them claim to have seen a *Triceratops* on the way to school this morning!

The experts may be only five years old and they laugh when they tell you about this morning's imaginary dinosaur, but the questions they ask are surprisingly serious and soon you have your hands full fielding their inquiries. No doubt, by the end of the day you will know a little more about dinosaurs too!

Rather than working with students, you might decide you would like to brush up on your store of paleontological knowledge in a more scholarly setting. Perhaps one day per week at the NMNS Paleobiology Division sounds interesting. In a laboratory the size of a warehouse, stacked to the ceiling with fossils, you could spend time preparing specimens for study or display.

More than 180 people (that's 40 more than the entire Museum staff) spend half a day to one full day a week at the Museum doing these things and more by working as volunteers. The programme involves all aspects of Museum activity. In the scientific divisions, specimens are catalogued, prepared, restored, and polished. On weekends, visitors are taken on guided tours through the *Mammals in Canada* gallery. The Information Centre packages and distributes Museum publications covering topics from "Caring For Your Pet Reptile" to "The Woolly Mammoth." These are sent to teachers, scientists, and the general public across Canada and around the world. The volunteer office handles calls from schools and makes preparations for visits by thousands of children from pre-school to high school. During the school year, students and teachers visit the activity centre and exhibit galleries for lessons on dinosaurs and fossils, rocks, mammals, birds, and plants.

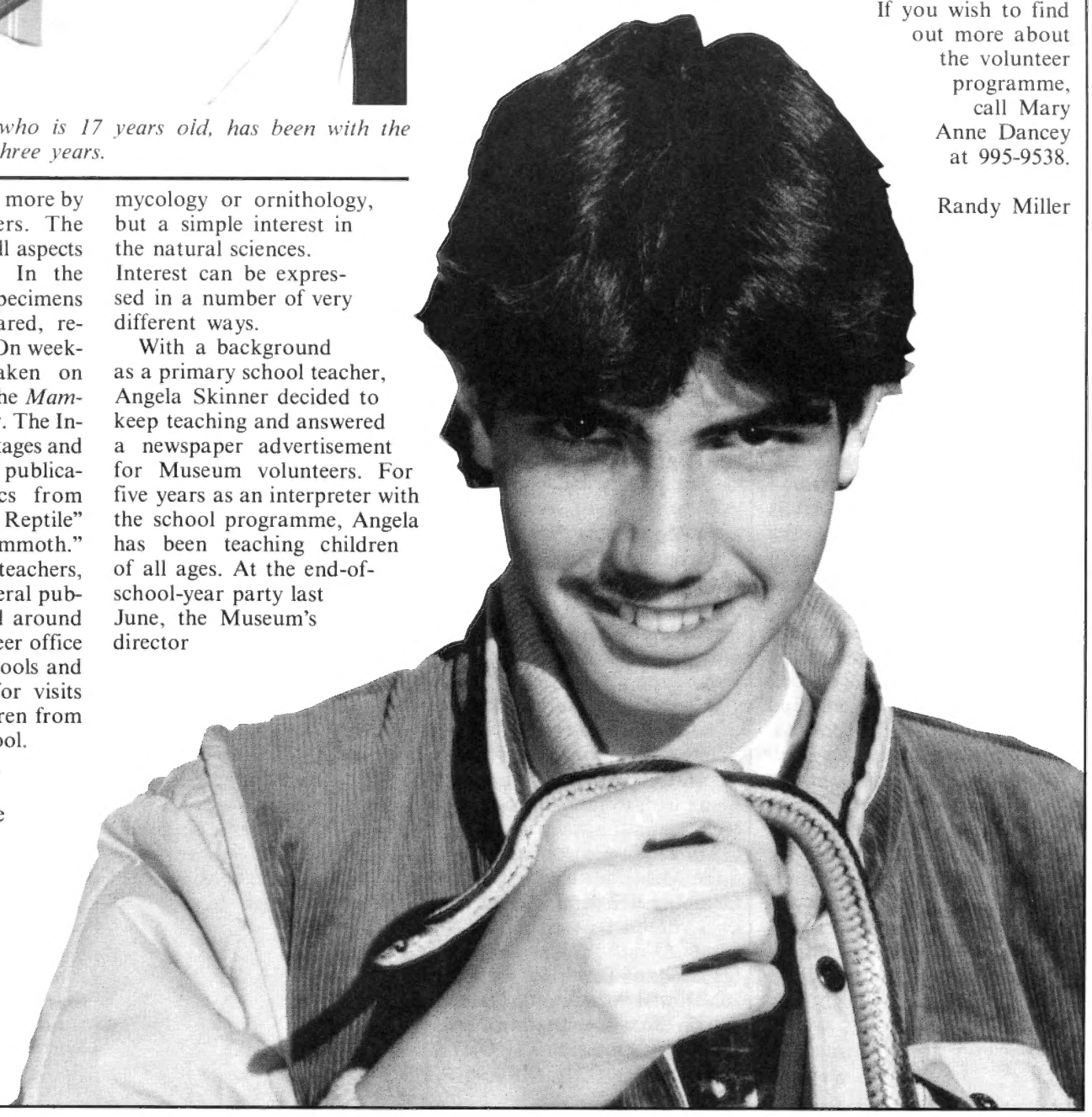
The common thread connecting all these people is not an advanced degree in mycology or ornithology, but a simple interest in the natural sciences. Interest can be expressed in a number of very different ways.

With a background as a primary school teacher, Angela Skinner decided to keep teaching and answered a newspaper advertisement for Museum volunteers. For five years as an interpreter with the school programme, Angela has been teaching children of all ages. At the end-of-school-year party last June, the Museum's director Dr. Alan Emery presented Angela, along with twelve other five-year volunteers, with a gold dinosaur pin in special recognition of long service. Karen Cunningham is a more recent recruit to the programme. Karen's start began through her interest in sculpture. Wanting to meet other people who worked with plastics, she joined Ron Séguin at the Display Preparation Section, where she has been helping to build dioramas for the *Plant Life* gallery. One of the younger volunteers is Raymond Saumure. Raymond, who is 17 years old, has been with the Museum for almost three years. He has been working in the Herpetology Section ever since he came to the Museum for advice on how to look after a snapping turtle. Raymond now spends several days a week caring for turtles and snakes, and taking measurements of specimens.

The volunteer programme allows the Museum to share its excitement with people who want the chance to experience discovery. In return, the volunteer gets to keep a part of the Museum's most valuable collection, a little bit of understanding about the natural sciences.

If you wish to find out more about the volunteer programme, call Mary Anne Dancey at 995-9538.

Randy Miller



EDITORIAL

Don't Confuse Me with the Facts!

Evolution or Creation, Conservation or Exploitation: controversial topics that demand to be addressed by a nature museum are legion. How is it possible to do so in such a way that no one will feel that they have been slighted? Modern museums claim that they try to present a balanced view based on all the facts presently available. This would not at first glance appear to be a problem — after all, scientists are in the business of collecting and synthesizing facts. Right? Of course.

But wait a moment! What is a fact? Presentations based entirely on science reject all supernatural forces, since these cannot be investigated. The role of a God, for instance, in shaping a universe is beyond the scope of science, except perhaps to discover what mechanisms might be employed to effect the creation. But some people find it insulting that their ancestry may be shared with that of all other living organisms — an ancestry that can be traced back to a primordial slime billions of years ago.

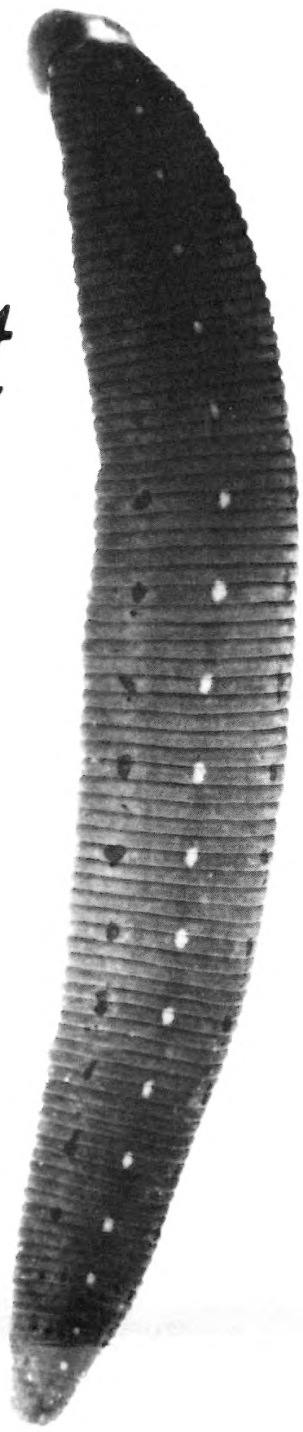
Also, while we take the viewpoint of science in explaining our universe, this is always filtered to some extent by our cultural and philosophical experiences. Take a look as you wander through our exhibits and ask yourself why the beaver diorama has a beautiful sunset as a backdrop, or why the display on contraband made from endangered species is done in an elegant rather than a gory fashion. If you look carefully enough you will find the personalities and sensitivities of the people who built these exhibits, as well as the "facts" displayed there.

Thus our museum is quite biased in its presentations. But there is also bias by the viewer: is it a fact that some life forms are beautiful and others not — or is this a reflection of cultural background?

Alan R. Emery
Director

A Sticky Subject

*The American medicinal leech, **Macrobdella decora**, in relaxed and curled positions.*



As do most people, you probably think of leeches as bloodsuckers, a horror to have on your leg. Who can forget Humphrey Bogart climbing, exhausted, on board the *African Queen* and discovering that he was covered with bloodsuckers!

Leeches are related to earthworms and have adapted to many environments. They live in fresh or salt water — even in polar seas — and on land in the tropics. There are 650 species and 70 of these are found in Canada. The presence or absence of jaws and teeth separates the "tigers" from the "pussycats." Jawless leeches suck body fluids and tissues of decomposing or soft-bodied animals through a sucking tube. In this fashion, piscicolid leeches feed on fish; and glossiphoniid leeches on snails, reptiles, and waterfowl. Erpobdellid leeches have muscular ridges to assist the sucking action and are scavengers. Most hirudinid leeches have toothed jaws and are the only "true" bloodsuckers, although they feed largely on insect larvae, amphibian eggs, and aquatic worms.

The true bloodsuckers, the ones with teeth, are best known for the occasional meals of blood they suck from mammals, including humans. The American medicinal leech, *Macrobdella decora*, is the most visible; its belly is bright reddish-orange, and its back is dark with two rows of black spots and one central row of red spots. The common American horse leeches, *Percymoorensis* sp., come in various shades from black to light green with darker mottling. These bloodsuckers lurk in the shallow waters of swamps, marshes, ponds, and lakes. They have voracious appetites and are very aggressive. The giant Canadian horse leech, *Mollibdella grandis*, can easily grow to 15 cm in length, and engulfs whole animals: a multitude of insect larvae, worms, tadpoles and tiny crustacae. Thank evolution that this giant leech has lost its teeth and cannot bite through human skin!

A bloodsucker that comes in contact with a human in a swimming area will grab hold with its sucker and inject an anaesthetic, which prevents the bite from being felt, as well as hirudin, an enzyme that prevents blood clotting. One thing to remember if you find a bloodsucker on you: *never* pull it off. When feeding, a bloodsucker holds on tightly with its sucker and will drop off once satiated. A more serious wound could result if the leech is pulled off prematurely. A mild irritant such as vinegar or a few grains of salt will encourage the leech to let go. Simple bites can be treated with calamine lotion and antiseptics to relieve itching. Leeches are difficult to control but their presence can be discouraged by clearing swimming areas of debris and vegetation that attract their usual prey. Leech traps that contain bait may also be used.

We are wary of bloodsuckers, but they cause no real harm; there has been only one recorded case of an allergic reaction to a bite. In fact, they have benefited mankind from as early as 200 B.C., since leeches were used for bloodletting before anticoagulants were discovered. Bloodsuckers were used to treat everything from heart pain to teething in babies; "leeching" became so popular in the nineteenth century that the European medicinal leech, *Hirudo medicinalis,* was hunted almost to extinction. Leeches are still used medicinally in some parts of the world. They are also studied in neurological research. In the wild, they are a vital link in the food chain. So you see, there is something to be said for the lowly leech! For further information, contact Jacquie at the Museum.

Jacqueline Madill
Invertebrate Zoology Division and
Micheline Stawski

FRIENDS · LES AMIS

National Museum of Natural Sciences — Musée national des sciences naturelles

Who are the "Friends"? They are members of a non-profit organization dedicated to promoting the goals of the Museum, a group of private citizens who recognize the Museum's need for outside support. The Friends assist the Museum to develop special collections, to conduct unusual research projects, and to reproduce existing exhibitions for circulation to other museums. The primary role of the Friends is to generate funds to enhance these worthwhile projects.

Are you interested in trips and expeditions to natural history locations, participation in Museum field work or behind-the-scenes tours of the Museum's collections and laboratories? Do you wish to find out about developments in other North American natural history museums by receiving *Explorer* magazine? Above all, are you concerned about our natural heritage and the Museum's role in preserving it? If so, please consider becoming a Friend. For further information, write to:

Friends of the
National Museum of Natural Sciences,
P.O. Box 634, Station "B",
Ottawa, Ontario K1P 5P7

BIOME

Editor-in-Chief:
Nick Bélanger

Acknowledgements:
Bonnie Livingstone
Annie J. Ollivier
Louise L. Trahan

Art Direction:
Exhibition Planning and Design Division, NMNS

Graphic Design:
Acart Graphic Services Inc.

Illustrations:
Eleanor M. Kish

Cette publication est également offerte en français

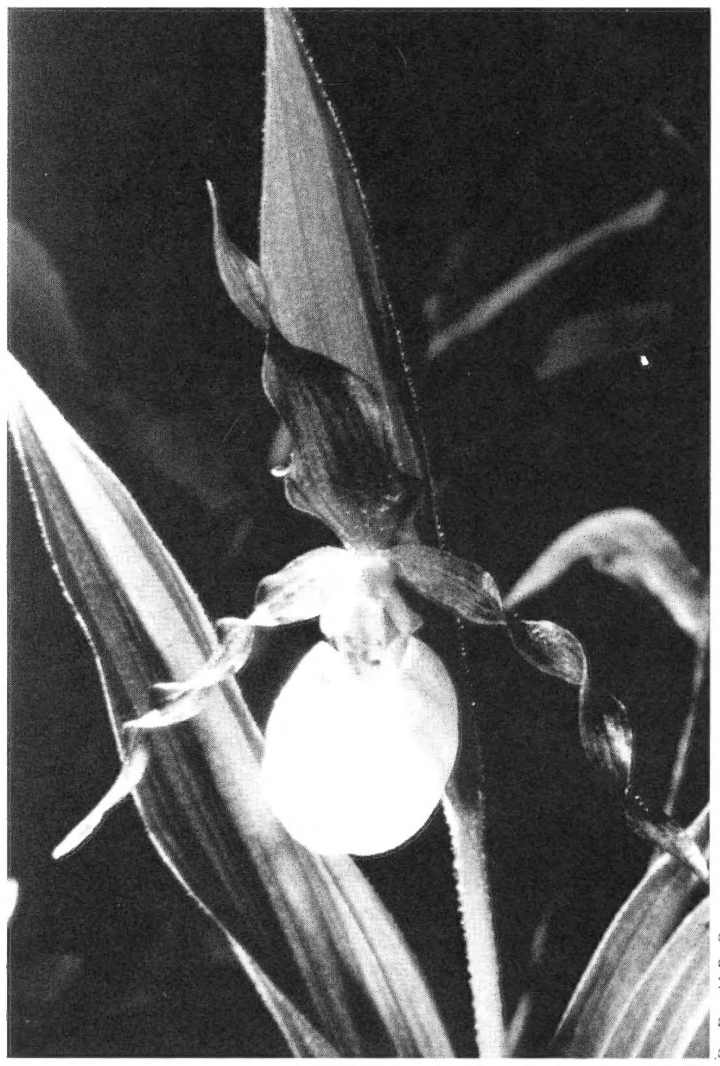
Comments and questions should be directed to:

BIOME
National Museum of Natural Sciences
Ottawa, Ontario
K1A 0M8

Rare and Endangered Plants in a Changing Landscape

In Canada, as in most of the world, vast areas of natural vegetation have been completely destroyed or altered so that they are now markedly different in appearance and species composition from the state in which they were found by early European settlers. Species of animals and plants were regularly overharvested, or their habitats reduced or destroyed, with the result that species such as the Passenger Pigeon, Great Auk, and blue walleye are now extinct. Others, including the wood bison, Whooping Crane, Acadian whitefish, cucumber tree, and small whorled pogonia orchid are endangered, and many others are threatened or rare.

For over 300 years, beginning in the early seventeenth century, vast tracts of natural vegetation have been removed from the landscape with little consideration given to the consequences. In southwestern Ontario, about 90% of the southern hardwood forests was removed to develop the rich forest soils for agriculture. Only pockets of forest remain as oases of refuge for many species that are now rare, or even endangered. In today's Prairie Provinces, native grassland species grow mainly in coulees, along roadsides, and in the few small reserves of prairie vegetation that have escaped the plough. The last major vestige of readily accessible virgin coastal forest in the Queen Charlotte Islands of British Columbia is threatened by the expanding needs of the lumbering industry; in the Tusket River Valley of southwestern Nova Scotia, unique coastal plain species, disjunct from their main ranges to the south, are threatened by recreational development and activities.



Dr. Donald R. Gunn

*The small white lady's slipper (**Cypripedium candidum**) is one of two plants officially protected under the Endangered Species Act of Ontario.*

The logging of vast areas of forest, the ploughing under of the prairie sod, and the filling in of wetlands have had a dramatic effect on all wildlife, and have jeopardized the survival of many species of our native flora and fauna. Recognizing the need for documenting the present status of the flora of Canada, botanists at the National Museum of Natural Sciences, and various collaborators, have been actively involved for the last ten years in compiling lists of the rare vascular plants of Canada. The lists for Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Quebec, Saskatchewan, and the Yukon Territories, published by the Museum, contain basic references to the rare species, and information on their distribution and status in Canada and the United States.

Because of the hundreds of species of rare plants listed for each province, these publications have focused greater attention on the need to protect species and habitats. As the most detailed inventories of rare plants in Canada, they have served as basic reference works on the subject, and have stimulated increased fieldwork that has clarified the status of many species of rare plants. They have also been of use to local and provincial authorities by drawing attention to rare species that occur under their jurisdiction, thereby highlighting the possible need for implementing conservation or management practices to ensure the continued survival of these plants. These lists have also been the basis for the selection of species that are suitable candidates for inclusion in status reports for the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

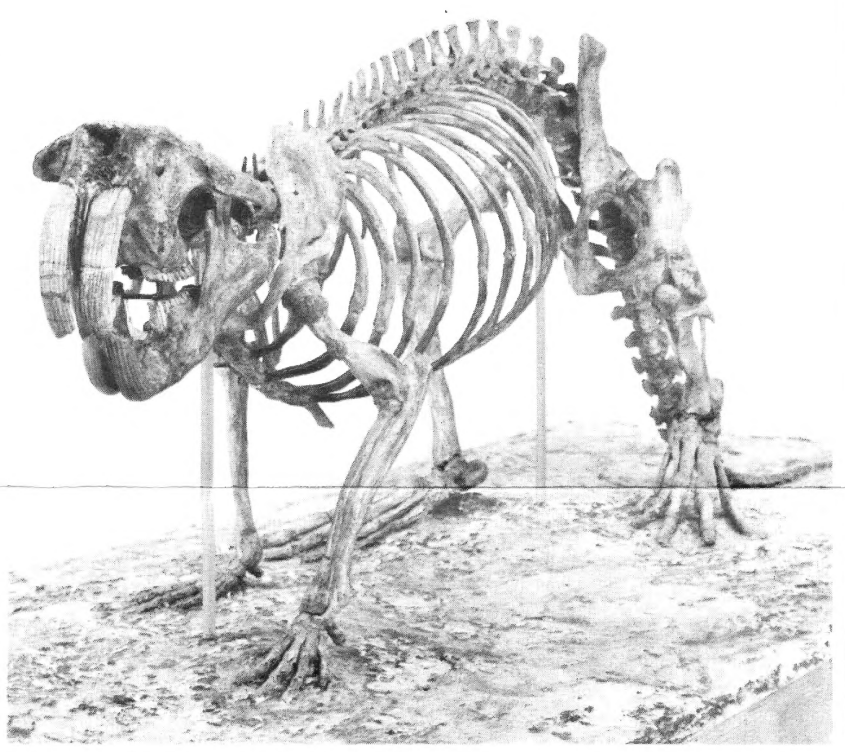
COSEWIC is a national committee of representatives of federal and provincial jurisdictions and several national conservation agencies that is concerned with the gathering of information on species that are thought to be in jeopardy and most in need of detailed study. Through its subcommittees on species of birds, fish and marine mammals, mammals, plants, and reptiles and amphibians, status reports are prepared and an official status such as rare, threatened, and endangered is given each species, depending on the degree of imminent threat. Museum curatorial staff have been actively involved from the start with the activities of COSEWIC as chairmen of most of the subcommittees and as authors or consultants.

At present, 390 species of rare vascular plants are recognized as candidates for status report preparation. This represents 12% of Canada's native flora of about 3300 species, excluding the 900 introduced species, and does not include the many species that are now thought to be extirpated in Canada because of man's activities. Of the 390 rare plants, only 26 have had status assigned; for 26 others, reports are in preparation or under review. Obviously, considerable work still remains in assessing the status of rare plants in Canada.

Not all plants are rare because of the actions of man. Many have probably always occurred sparingly because of their restrictive habitat requirements or limited habitat availability. It is clear, however, that man's impact on the state of whole ecosystems has been so extensive that utmost care must be taken to ensure the survival of the remaining fragments in these times of continued pressure on the environment.

Erich Haber
Botany Division

Building a Giant Beaver



Some teeth! This giant beaver skeleton was borrowed from the St. Paul Science Museum for moulding and casting.

Fossils of giant beavers (*Castoroides ohioensis*) lead the mind on flights of fancy about beavers the size of bears felling trees with a single bite and creating massive ponds. Apart from the size (one large skeleton measures 2.5 m long) no evidence exists to support such fantasies, but giant beavers are still an intriguing part of the fossil record, having become extinct about 10,000 years ago. In Canada their remains have only been found in the Old Crow area of the northern Yukon Territory and in the Don Valley, Toronto. Their bones are similar to those of modern beavers except that they are much larger and their teeth have some structural differences.

We have felt for some time that a giant beaver skeleton would be an important part of any future fossil gallery but unfortunately our specimens are fragmentary and we have been unable to assemble even a composite skeleton (one made with parts from more than one individual). Therefore we decided to find a skeleton that could be cast.

Giant beaver remains are more common in the United States than in Canada, but still only three nearly complete specimens are known and all of them are mounted. Casting a fossil may damage it and being mounted compounds the problem. Nevertheless, Dr. Bruce Erickson of The Science Museum in St. Paul, Minnesota, kindly allowed us to borrow their giant beaver skeleton for moulding and casting. This specimen is immature and measures about 1.7 m long. When received, the bones were quite dry and brittle. The specimen was cleaned, consolidated, and a few minor cracks were repaired. The specimen had to be in top condition so that it would not be damaged when making the mould.

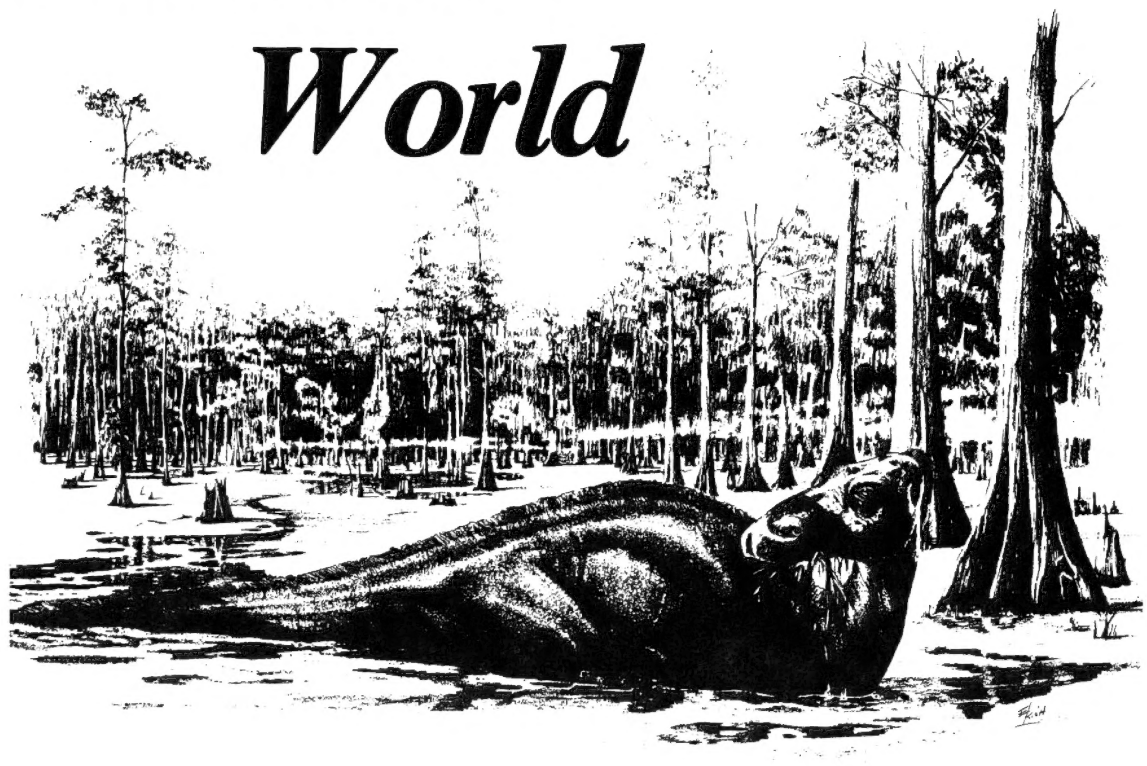
Moulding and casting fossils for museum display is always an exacting process, but the prospects of doing a fragile, mounted giant beaver seemed overwhelming. The maximum amount of detail had to be preserved while holes and undercuts required infilling to prevent damage when the moulds were being removed from the skeleton. We decided to make eight separate moulds: the skull, the jaw, the four legs, the tail, and the trunk. They were made of latex strengthened with cheesecloth and were supported by light fiberglass mother moulds. Their construction was lighter than normal because of the complexity and fragility of the skeleton. The sections were then cast with epoxy resin and the rough edges of the casts were smoothed down.

Assembling the skeleton was quite easy because it had been cast in large sections. The legs and tail were simply pinned and glued to the trunk and the head was supported on a rod that had been cast into the vertebral column. Once the parts were pieced together, detailed painting finished the project. The work was completed in approximately eleven weeks. On the original skeleton, only a few old plaster joints separated during the moulding but they were easily repaired.

The giant beaver cast is a valuable asset to our museum, and has great potential for display and exchange with other museums. A publication on the giant beaver is being prepared for the *Neotoma* series and should be available in 1986.

Gerry Fitzgerald
Paleobiology Division

Re-creating a Vanished World



The Duck-billed dinosaur ***Edmontosaurus*** *in a bald-cypress swamp near Drumheller, Alberta, 71 million years ago.*

Eleanor Kish has been able to evoke through her canvases, not only the portrayal, but also the mood of an ancient age.

Many illustrators have drawn pictures of unicorns, dragons, and other imaginary creatures. The portrayals vary, but that doesn't matter because these subjects are the products of myths. On the other hand, there are some things that exist but are unseeable, such as atoms or the centre of the earth. What does it take then, to credibly depict something that is unseen but real? A dinosaur, for example?

Surely this calls for a special kind of artist. Someone such as Eleanor M. Kish, the foremost painter of dinosaur reconstructions today, and the artist featured in the exhibition entitled *A Vanished World* that was part of last year's "Dinosaur Extravaganza" at the Museum.

Ely Kish is a storyteller who uses charcoal, ink and paint instead of words, and detail, colour and shading instead of phrases. To be a good storyteller one must also be a good listener. From her first association with Dr. Dale A. Russell, of the Museum's Paleobiology Division, she distinguished herself by her ability to blend scientific accuracy with her own inspiration in re-creating vistas of prehistory.

The ten spectacular and highly acclaimed paintings that appear in the Museum's 1977 publication, *A Vanished World: The Dinosaurs of Western Canada*, written by Dr. Russell, formed the basis of the exhibition, which toured Canada following its Ottawa premiere. The works were also used in a recent BBC production on dinosaurs and led to a commission from the Smithsonian Institution for four more paintings for its publication, *The American Land*. According to Dr. Russell, the success of the paintings can be attributed to the close collaboration between artist and scientist and to their approaching the subject as if it were a forensic reconstruction.

Before her paintbrush touched the canvas, Ely would make a model skeleton of the dinosaur in question, based on fossils and scientific data provided by Dale. Onto this frame, following the paleobiologist's guidance and encouragement, she would mould the muscle and tissue from clay. Once the three-dimensional model was completed, the effect of shadow and light would be observed as the artist considered what the animal's movements might have been through its habitat.

From this combination of data, visualization and inner vision, Ely has been able to evoke through her canvases, not only the portrayal, but also the mood of an ancient age. The CBC science program, *The Nature of Things*, recently included a profile of her at work in this way.

For paleobiologists, the scientific authenticity of this artist's paintings is refreshing, as they promise a new popular conception of prehistoric animals; a conception more in keeping with available data. Dale, who cringes at the thought of Hollywood dinosaur movies, says that such films and even some popular "serious" works generally show the ancient beings as over-inflated, "puffy" monsters. The sleeker, more reptilian creatures of the Kish reconstructions are a welcome relief! At present, Ely is working on a new series of paintings for Dale's forthcoming book, *Dinosaurs of North America.*

Carol Atwell Kinley

The Maple Leaf Forever

The maple leaf was confirmed in 1965 as Canada's first official national emblem. Proudly depicted in vivid red upon a white background, flanked by red, the maple leaf allows easy recognition of our national flag. The maple leaf has been considered emblematic of Canada since 1700 or possibly even earlier. When the Prince of Wales (later King Edward VII) visited Canada in 1860, members of the welcoming procession wore facsimiles of the maple leaf as "the emblem of the land of their birth."

The maple leaf was first incorporated into the designs of Canada's coinage when it appeared on the obverse of the Victoria large one cent piece. It has since been used on all subsequent designs of our one cent, five cent and fifty cent coins approved by the Royal Mint. The coat of arms of Canada, Ontario and Quebec, as well as the Queen's personal Canadian flag, all bear stylized or accurate representations of a sprig of three leaves of the maple. The maple leaf is a uniquely Canadian emblem.

The eleven-point, stylized representation of the maple leaf, as it occurs on our flag, depicts the leaf of the sugar maple tree (*Acer saccharum* Marshall). The sugar maple tree is a large, beautiful tree with spreading branches, which when grown in open areas, develops a full, roundish outline, providing one of our finest shade trees. Although its natural distribution is not restricted to Canada (the sugar maples form rich dense forests from the Gaspé Peninsula west to eastern Manitoba and southward to the uplands of the southern states of the U.S.A.), the trees provide one of eastern Canada's most important commercial products — maple syrup.

Maple trees have long been prized for their valuable timber, especially for woodworking and furniture, and for their beautiful yellow to scarlet leaves in autumn.

The family of maples, of which there are over 200 species around the world, occurred in Canada long before the Europeans first discovered the beauty of these trees in North America. In fact the Paleobiology Division of the NMNS has recently collected superb specimens of leaves and "fruits" of the genus *Acer* from 49-million-year-old rocks near Kamloops, British Columbia.

The fruits of a maple are dry, winged and termed samaras. We often see them whirling down from the branches of mature maples like little helicopters. At least some will germinate and develop into yet another generation of forest trees.

The samaras collected from the rocks in British Columbia differ in detail from those of today's maples, indicating to the paleobotanist that these fossil forms represent an extinct species. Probably Canada's maples have evolved from this or possibly other extinct species.

This fall, as you partake of another beautiful brisk afternoon in the woods, reflect for a moment on the heritage, the antiquity and the uniqueness of our maple trees, especially that of the sugar maple and its importance as one of our national emblems. The maple leaf has virtually been "forever."

David M. Jarzen
Paleobiology Division